PRECONFIGURED iRMX™ 86 OPERATING SYSTEM

- **Ready-to-run Preconfigured iRMX™ 86 Operating System for iSBC® systems**
- **Efficient realtime multitasking scheduler with 255 priority levels**
- **Complete support of 8087 numeric processor extension**
- **Direct support of independent software vendor compilers and applications**
- **Direct support for Intel on-target compilers and development tools**
- **Simple program load and debug with Bootstrap and Monitor in 2732A EPROMs**
- **Device drivers included for up to four diskettes, serial terminal interface, and parallel line printer**
- **A complete, high-performance, execution engine for UDI applications**

The Intel Preconfigured iRMX 86 Operating System is a flexible, realtime, and multitasking system which is configured to run on a low-cost, iSBC 86-based hardware system. The iRMX 86 Operating System is designed to provide a structured and efficient environment for many time- and performance-critical applications such as factory automation, business data and text processing, medical electronics, data communications and process control. The Preconfigured System provides this environment without requiring specific hardware and software configurations. Based on the UDI software interface architecture for optional compilers and interpreters, the iRMX 86 PC System supports development of sophisticated applications using the target hardware. A ready-to-use comprehensive human interface provides advanced services including creating and maintaining a hierarchical file system, entering the debug monitor and backing-up diskette volumes.

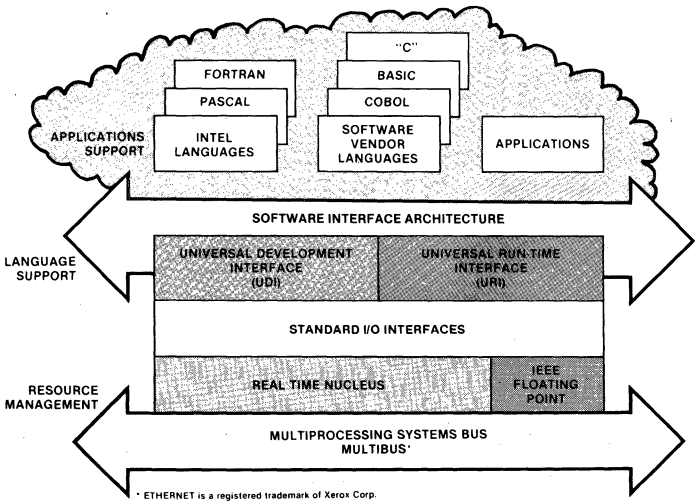

Figure 1. iRMX™ 86 PC Support for Standard Interfaces

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Order Number: 210422-001

The Preconfigured iRMX 86 Operating System is a complete set of system software modules that are ready-to-run in a simple MULTIBUS system consisting of an iSBC 86 computer, memory, and a diskette controller board. All the features of the iRMX 86 Operating System are provided along with a bootstrap monitor to load the system diskette into the system.

The Preconfigured iRMX 86 System provides both implicit and explicit management of system resources. These resources include the processor's time and registers, up to one megabyte of system memory, independent interrupt sources, all input and output devices, as well as directory and data files contained on up to four diskettes.

FUNCTIONAL DESCRIPTION

In applications where computers are required to perform many functions simultaneously, the iRMX 86 Operating System provides a multiprogramming environment in which many independent, and optionally multitasking, applications may run. Each application environment may be treated separately to allow application programmers the flexibility to separately manage each application's resources. A complete description of the iRMX 86 Operating System can be found in the iRMX 86 Data Sheet (Order Number: 210330).

User Commands

The iRMX 86 PC System provides a number of powerful tools necessary for the development of microcomputer applications. They are included on the system disk and brought into memory when needed to perform the functions listed in Table 1. These commands are especially useful for managing user programs and data stored on diskettes.

File Management

The iRMX 86 PC file management system allows users to access information on diskettes by referring to a file with its ASCII name. The names of files stored on a disk are catalogued in special files called directories. As directories are themselves named files, the iRMX 86 file system allows directories to contain the names of other directories. This leads to a hierarchical file structure as illustrated in Figure 2. This structure is useful for isolating file names of particular applications, and for tailoring the system's data to the requirements of users and applications sharing storage devices.

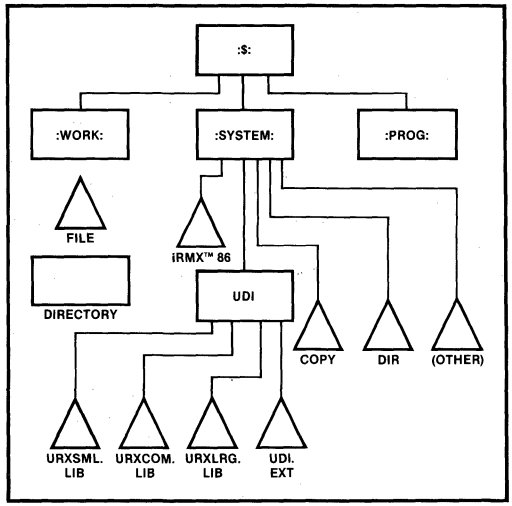

Figure 2. iRMX™ 86 PC System Disk Directory Tree

Table 1. iRMX™ 86 PC Commands

Command	Function
ATTACHDEVICE	Gives a logical name to a specific disk, CRT, or Printer device
BACKUP	Copy directories and files from one device to another
COPY	Copy one or more files to one or more destination files
CREATEDIR	Create a directory file to store the names of other files
DATE	Set the system calendar
DELETE	Delete a file or directory
DEBUG	Enter the System Monitor
DETACHDEVICE	Remove a device from the system
DIR	List the names, sizes, owners, etc. of the files contained in a directory
FORMAT	Prepare a new diskette volume for use
RENAME	Change the name of a file
RESTORE	Recreates a volume saved by BACKUP
SUBMIT	Start the processing of a series of commands stored in a file
TIME	Set the system time-of-day clock
VERIFY	Verify the structure of an iRMX 86 Named File volume, and check for possible disk data errors

Figure 2 also shows the structure of the directories on the iRMX 86 PC system diskette. It contains all the programs and commands that make up the iRMX 86 PC System. Users may add other files and directories anywhere in the structure. Whenever an operator makes a request to use one of these files, the System will search the appropriate directory tree in order to find the necessary information about the file's size, access rights, and specific location on the diskette. Applications may also refer to a specific file or group of files by specifying the directory from which to start the search.

Standard Interfaces

The iRMX 86 PC System supports a group of 25 easy-to-use standard system calls known as the Universal Development Interface (UDI). Figure 1 shows how this interface provides iRMX 86 systems the capability of using many compilers and language translators. These include the iAPX 86 and 88 Macro Assembler, and the PASCAL 86/88, PL/M 86/88, and FORTRAN 86/88 compilers available from Intel. They also include a number of other Intel development tools, and language translators and applications available from independent software vendors.

The standard UDI software interface establishes a path to future Intel software products and opens the door to a host of compilers, interpreters, and application programs available from independent software vendors. These UDI calls are easy-to-use and are listed in Table 2. A more complete list of all the system calls provided by the iRMX 86 PC System can be found in the iRMX 86 Data Sheet.

Table 2. UDI System Calls

System Call	Function Performed
Memory Management:	
DQ$ALLOCATE	Creates a segment of a specified size for use by the application.
DQ$FREE	Returns the specified segment to the system.
DQGETSIZE	Returns the size of the specified segment.
File Management:	
DQ$ATTACH	Creates a connection to a specified file.
DQ$CHANGE$EXTENSION	Changes or adds an extension to a file name.
DQ$CLOSE	Closes the specified file connection.
DQ$CREATE	Creates a Named File for use by the application.
DQ$DELETE	Deletes a Named File.
DQ$DETACH	Closes a Named File and deletes its connection.
DQ$OPEN	Opens a file for a particular type of access.
DQ$READ	Reads the next sequence of bytes from a file.
DQ$RENAME	Renames the specified Named File.
DQ$SEEK	Moves the current position pointer of a file.
DQ$TRUNCATE	Truncates a file to the specified length.
DQ$WRITE	Writes a sequence of bytes to a file.
Process Management:	
DQ$EXIT	Exits form the current application job.
DQGETCONNECTION$STATUS	Returns the current status of the specified file connection.
DQ$OVERLAY	Causes the specified overlay to be loaded.
DQ$SPECIAL	Performs special I/O related functions on terminals with special control features.
Exception Handling:	
DQGETEXCEPTION$HANDLER	Returns a pointer to the program currently being used to process errors.
DQ$DECODE$EXCEPTION	Returns a short description of the specified error code.
DQ$TRAP$EXCEPTION	Identifies a custom exception processing program for a particular type of error.

Table 2. UDI System Calls (con't.)

System Call	Function Performed
Application Assistance:	
DQGETARGUMENT	Returns the next argument from the character string used to invoke the application program.
DQGETSYSTEM$ID	Returns the name of the underlying operating system supporting the UDI.
DQGETTIME	Returns the current time of day as kept by the underlying operating system.
DQ$SWITCH$BUFFER	Selects a new buffer from which to process commands.

Simple System Start-Up

The iRMX 86 PC system includes a comprehensive Monitor and Bootstrap Loader in four 2732A EPROMs. These programs have been configured to support the hardware shown in Figure 3. As shown, the Monitor is capable of communicating with an Intellec Microcomputer Development System. This communications link can be used to transfer programs and data between an iRMX 86 System and the Intellec Development System.

This start-up system provides a perfect environment for the development and efficient execution of applications programs. When these programs require different I/O devices or a different software configuration, they can be moved to any other iRMX 86 System directly. The iRMX 86 PC System includes a separate diskette with the complete set of iRMX 86 multitasking system calls for those programmers requiring more function than is supplied by the UDI.

Debugging Aids

The iRMX 86 PC System includes a System Monitor that provides the capability of debugging one task at a time. The monitor includes instructions for examining and modifying the contents of all 8086 and 8087 registers, setting system breakpoints, single-stepping, examining and modifying system memory, executing CPU I/O, and disassembling program instructions.

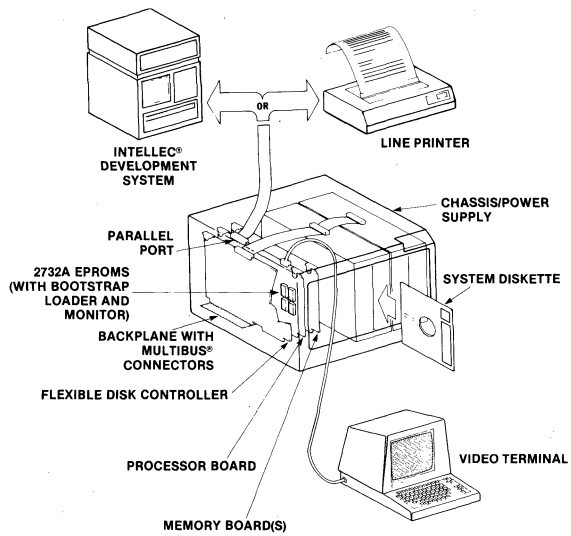

Figure 3. Hardware Configuration of PC System

SPECIFICATIONS

Optional Intel® Software Products

iRMX 86	Fully configurable iRMX 86 Realtime Operating System
iRMX 860	iRMX 86 Development Utilities Package including the iAPX 86 and 88 Linker, Locater, and Macro Assembler, Librarian, and the iRMX 86 Editor
iRMX 861	PASCAL 86/88 Compiler for execution on iRMX 86 Systems
iRMX 862	FORTRAN 86/88 Compiler for execution on iRMX 86 Systems
iRMX 863	PL/M 86/88 Compiler for execution on iRMX 86 Systems
iSBC 957B	iAPX 86 System Monitor and Microcomputer Development System Communications Link

Supported Hardware Products

iSBC® MULTIBUS® PRODUCTS

iSBC 86/12A, 86/14, and 86/30 Single Board Computers

iSBC 208 Flexible Disk Controller

PERIPHERAL DEVICE

CRT — RS232 at 9600 Baud

Printer — Centronics-type Parallel Interface

Diskettes — 2 to 4 Single- or Double-Density, Single- or Double-Sided

Memory Requirements

200K Bytes to support applications less than 16K Bytes.

384K Bytes to support Intel's PASCAL 86 Compiler.

256K Bytes to support Microsoft's Basic Interpreter and a 32K Byte user program and data space.

Reference Material

iRMX 86 Operating System Data Sheet (210330)

Getting Started with the iRMX 86 System (144340-001) (Included in PC System Package)

Introduction to the iRMX 86 Operating System (9803124-03)

iRMX 86 Installation Guide (9803125-04)

iRMX 86 Configuration Guide (9803126-04)

iRMX 86 NUCLEUS Reference Manual (9803122-03)

iRMX 86 Terminal Handler Reference Manual (143324-01)

iRMX 86 Debugger Reference Manual (143323-01)

iRMX 86 Basic I/O System Reference Manual (9803123-04)

iRMX 86 Loader Reference Manual (143318-01)

iRMX 86 Extended I/O System Reference Manual (143308-001)

iRMX 86 Human Interface Reference Manual (9803202-002)

iRMX 86 System Programmer's Reference Manual (142721-003)

Guide to Writing Device Drivers for the iRMX 86 and iRMX 88 I/O Systems (142926-003)

iRMX 86 Programming Techniques (142982-002)

User's Guide for the iSBC 857B iAPX 86,88 Interface and Execution Package (143979-002)

iRMX 86 Disk Verification Utility Reference Manual (144133-001)

iRMX 86 Pocket Reference (142861-002)

Edit Reference Manual (143587-001)

Runtime Support Manual for iAPX 86,88 Applications (121776-001)

Guide to Using iRMX 86 Languages (143907-001)

Reference material may be ordered from any Intel sales representative, distributor office, or from Intel Literature Department, 3065 Bowers Avenue, Santa Clara, CA 95051.

Training Courses

Introduction to the iRMX 86 Operating System

iRMX 86 I/O System Concepts

ORDERING INFORMATION

The iRMX 86 PC System is provided on a double-density, iRMX 86 compatible system diskette (format type E). The iRMX 86 PC System is shipped with a comprehensive users' manual ("Getting Started With The iRMX 86 System), Bootloader and Monitor EPROMs, and the complete iRMX 86 Interface Libraries contained on a second diskette. A full year of Intel Support Level D (Software Problem Report Service) is included. This Intel copyrighted system is licensed as a single-use software product as defined by Intel's Master Software Licenses.

Order Code	Description
RMX 86PC E	Complete Preconfigured iRMX 86 Operating System with interface libraries, bootstrap monitor, and user documentation.

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INTEL CORPORATION, 3065 Bowers Avenue, Santa Clara, CA 95051 • (408) 734-8102 x598

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